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Heart Disease Prediction Using Machine Learning

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ABSTRACT: Heart Disease is one of the primary basis of death worldwide over the span of the past few decades. It associates many risk factors in heart disease and a need of the early diagnosis in achieve prompt management of the disease. Several machine learning techniques are used to analyze complex data to predict heart disease. Here we have used Random Forest Algorithm for the heart disease prediction. Heart Disease prediction depends on various attributes which are used in prediction. The data corresponding to that attributes are trained and tested using machine learning Random Forest algorithm. The data which is required is taken from the user. The data is provided to that algorithm and the heart disease prediction will be done by the Random Forest algorithm. The obtained results are displayed to the user.

KEYWORDS: Machine Learning, sklearn, Random Forest , pandas

I. INTRODUCTION

Heart disease is one of the major causes of illness and death in the world. Predicting heart disease is considered one of the most important studies in the data analysis phase. The burden of heart disease is growing rapidly around the world from the last few years. Many studies have been conducted in an effort to identify the most influential features of heart disease and to accurately predict overall risk. Heart disease is the same it has been portrayed as a silent killer that leads to unseen human death symptoms. Early diagnosis of heart disease plays an important role in decision-making by changing the lifestyle of high-risk patients and reducing complications. Machine learning proves to be effective in helping to make decisions once and for all predictions from large amounts of data produced by the health care industry. This project aims to predict future Heart Disease by analyzing patient data that differentiates whether they have heart disease or not using a machine learning Random Forest algorithm. The machine learning strategies can be a blessing in disguise. Even if heart disease can occur in irresponsible ways, there is a common set of risk factors that determine whether a person will eventually be at risk for heart disease or not. By collecting various detail sources, to put it under the appropriate headings and finally analyze to extract the required data we can say that this process can be changed very well to make a heart disease prediction.

II. AIM AND SCOPE

In the existing system, They develop an Intelligent system using data mining modeling technique named as Naive Bayes. It retrieves hidden data from a stored database and compares the user values with a trained data set. It answers complex queries for diagnosing heart disease and assists health care practitioners to make intelligent clinical decisions. When the values are dependent on each other Naive Bayes cannot give proper output and more accuracy.

In this proposed system, we focus on predicting heart disease using machine learning Random Forest algorithm. We proposed the system "Heart Disease Prediction Using Machine Learning" that will predict the heart disease using multiple features. In this proposed system, the available dataset is taken and out of this 80% of data is used for training purpose and remaining 20% of data used for testing purpose. It is implemented as a web based app. Here, the raw data is stored in '.csv' file. In the proposed system, we used Python as a programming language. We majorly used three modules for prediction. The pandas module is used to work with '.csv' files. Sklearn module, which provides an

efficient tool for RandomForest Algorithm. The pickle module is used for storing and accessing the training model state.

Random Forest Algorithm considers the dependencies between the attributes. As there will be creating so many decision trees in Random Forest Algorithm each and every feature will be taken into consideration while building the model. Instead of probability outputs algorithm conducts voting on the decision trees and finally the majority output will be provided.

Random Forest Algorithm:

Random Forest is a supervised learning machine learning algorithm which is mainly used for classification and regression problems. The main working of this algorithm is creation of multiple decision trees and prediction will be based on voting. Each and every decision tree constructed by taking some random attributes and the test record will be passed to all the decision trees and the final output will be provided based on voting.

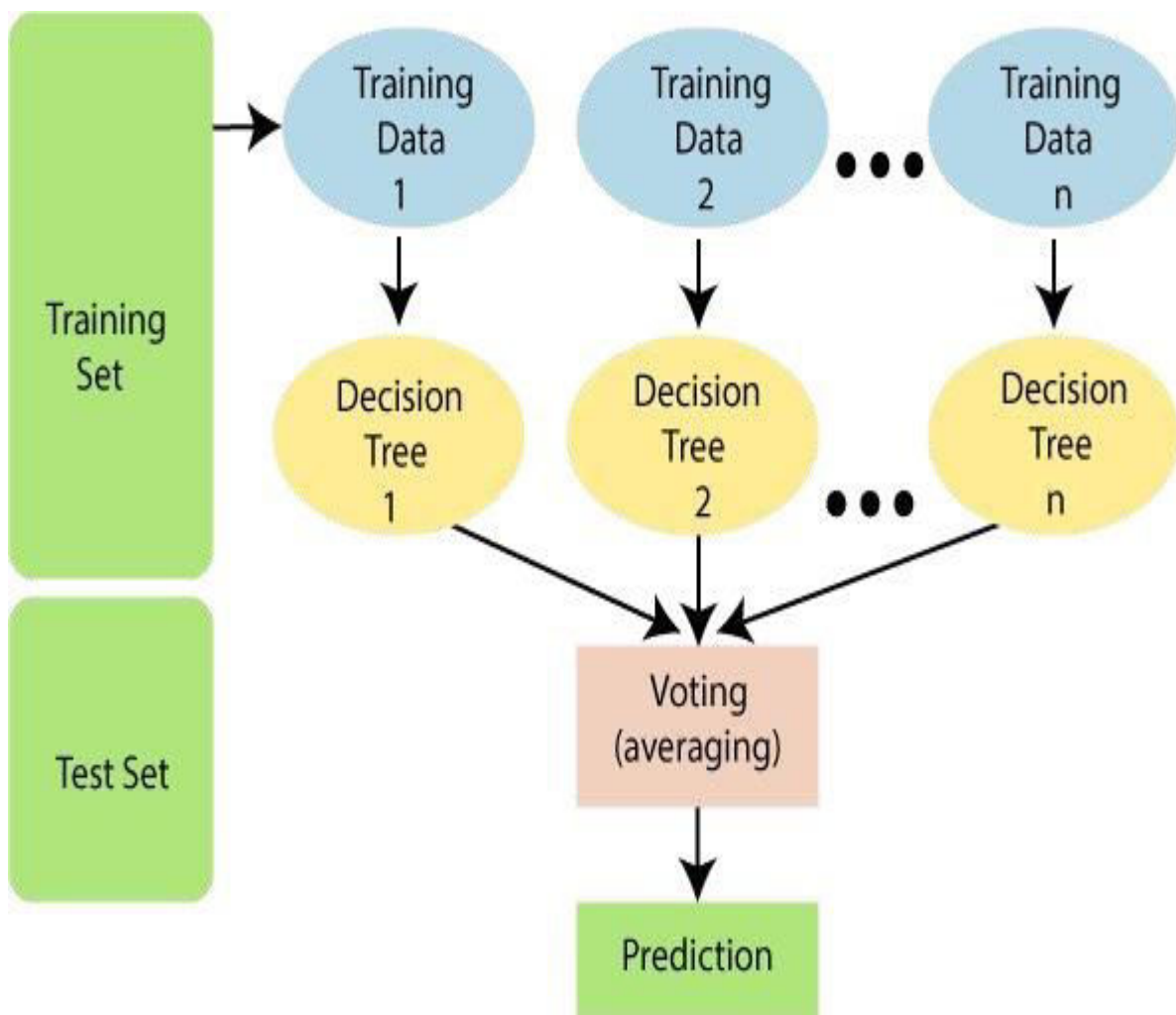


Fig 1. Working of Random Forest Algorithm

Flow chart:

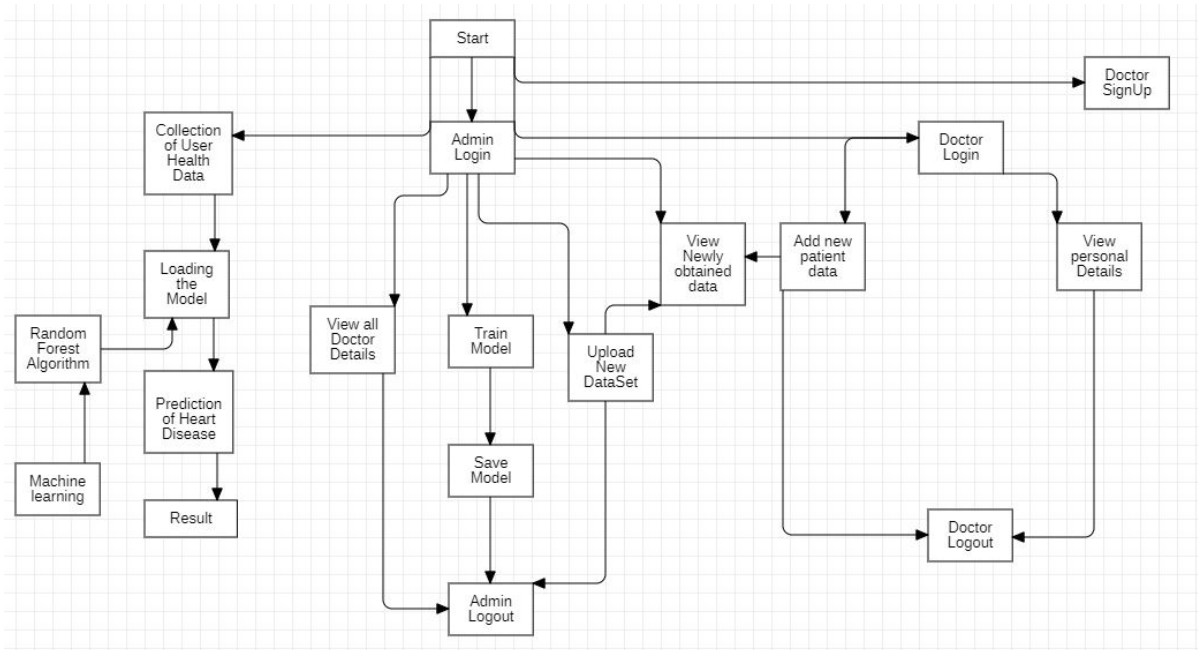


Fig 2. System Flow chart

ADMIN MODULE: Admin can view all doctor details.

- Admin has the ability to upload the datasets.
- Admin can view the data uploaded by all the doctors along with the data in the dataset.
- Admin can able to train the model by combining new data and the existing data.

DOCTOR MODULE:

- Doctor can able to sign up and sign in.
- Doctor can able to new data.
- Doctor can view his details.

END-USER MODULE: In the User Module

- User can able to enter the data required for prediction.
- User can view the result after prediction



III. RESULTS

Heart Disease Prediction Home Doctor Login Doctor SignUp Admin Login

Heart Disease Prediction

Age	<input type="text" value="37"/>
Gender	<input type="text" value="Male"/>
Chest Pain	<input type="text" value="Atypical Angina"/>
Resting Blood Pressure(in mmHg)	<input type="text" value="130"/>
Serum cholesterol(in mg/dl)	<input type="text" value="250"/>
Fasting Blood Sugar	<input type="text" value="<=120mg/dl"/>
Electrocardiographic Results	<input type="text" value="ST-T wave abnormally"/>
Max Heart Rate Achieved	<input type="text" value="187"/>
Exercise Induced Angina	<input type="text" value="No"/>
ST depression induced by exercise relative to rest	<input type="text" value="3.5"/>
ST Segment slope	<input type="text" value="upsloping"/>
Number of major vessels colored by fluoroscopy	<input type="text" value="0"/>
Thalassemia	<input type="text" value="fixed defect"/>
<input type="button" value="Predict"/>	

Fig 3. User Input Data1

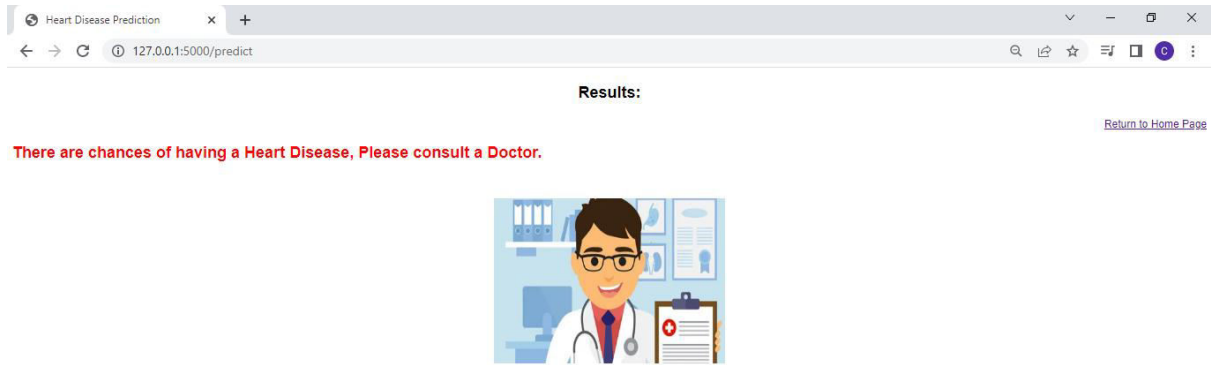


Fig 4. User Result1

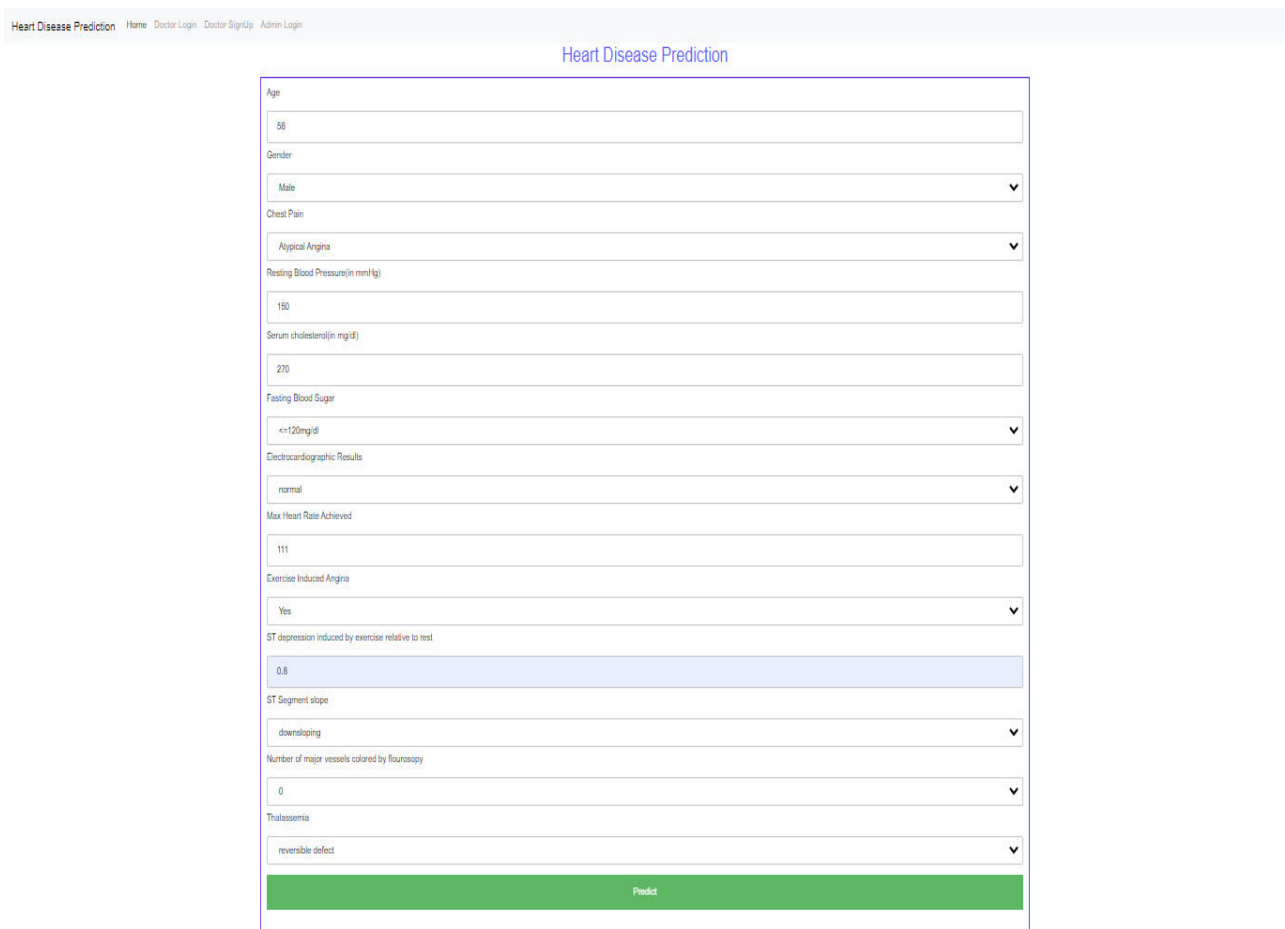


Fig 5. User Input Data2

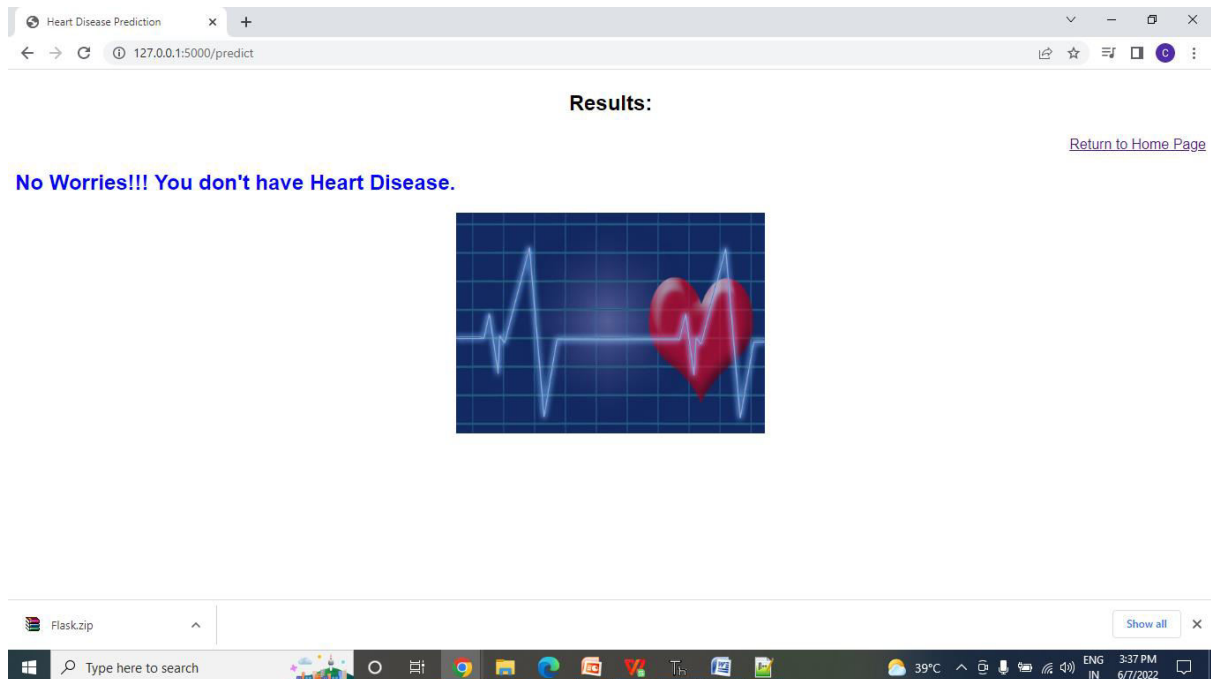


Fig 6. User Result2

IV .CONCLUSION

In this project random forest data mining algorithm was implemented for prediction of heart disease. In the proposed work we obtained classification accuracy of 86.9% for prediction of heart disease with diagnosis rate of 87% using random forest algorithm. The proposed system can also be used for prediction of other disease by applying other machine learning algorithm such as Naïve Bayes, decision tree, K-NN, Linear regression, neural networks. Neural Networks will use high CPU and GPU and Memory but will be not cost effective. The devices used to train neural networks must have high configuration. These neural networks will also be trained in cloud.

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